

## CLAIMS

What is claimed is:

1. A method for dynamically inverting an Asymmetric Digital Subscriber Line (ADSL) system comprising a central exchange equipment (CE) connected to a service provider network and a user equipment (UE) connected to a user workstation, wherein said CE and said UE are interconnected by a PSTN link, said CE including an input line for transmitting high-speed data from said service provider network to said user workstation and an output line for receiving medium-speed data from said user workstation and further comprising CE coding/decoding means for coding said high-speed data and decoding said medium-speed data, said UE including an input line for transmitting medium-speed data from said user workstation to said service provider network and an output line for receiving high-speed data from said service provider network and also including UE coding/decoding means for coding said medium-speed data and decoding said high-speed data, said method comprising:

transmitting an inverting request message from said UE to said CE;

in response to said inverting request message, activating said CE coding/decoding means for coding medium-speed data on said CE input line and decoding high-speed data on said CE output line;

25 transmitting a first acknowledgment message from  
26 said CE to said UE informing said UE that transmission in  
27 reverse mode is authorized; and

28 in response to said first acknowledgment message,  
29 activating said UE coding/decoding means.

1 2. The method of claim 1, further comprising  
2 transmitting a second acknowledgment message from said UE  
3 to said CE informing said CE that switching into reverse  
4 mode is completed.

1 3. The method of claim 2, wherein said second  
2 acknowledgment message is a tone sequence that is  
3 generated by a tone generator in said UE and decoded by a  
4 tone decoder in said CE.

1 4. The method of claim 2, wherein said second  
2 acknowledgment message is either a control message  
3 transmitted in a high-speed control channel from said UE  
4 to said CE or said superframe itself.

1 5. The method of claim 2, wherein data that is received  
2 by said CE from said service provider network after  
3 transmission of said first acknowledgment message from  
4 said CE to said UE, are stored in a FIFO buffer until  
5 said second acknowledgment message is received by said  
6 CE.

1        6.    The method of claim 5, wherein transmission in  
2        reverse mode from said CE is authorized in response to  
3        said FIFO being full prior to said second acknowledgment  
4        message being received by said CE.

1        7.    The method of claim 1, wherein said step of  
2        transmitting an inverting request message is performed in  
3        response to a request from said user workstation to  
4        transmit high-speed data on said UE input line and to  
5        receive medium-speed data on said UE output line.

1        8.    The method of claim 1, wherein said step of  
2        activating said UE coding/decoding means further  
3        comprises:

4               coding high-speed data which will be transmitted on  
5               said UE input line; and

6               decoding medium-speed data which will be received on  
7               said CE output line.

1        9.    The method of claim 1, wherein said inverting  
2        request message is a tone sequence that is generated by a  
3        tone generator in said UE and decoded by a tone decoder  
4        in said CE.

1 10. The method of claim 1, wherein said inverting  
2 request message is a control message transmitted in a  
3 control channel multiplexed with data in a data  
4 superframe transmitted from said UE to said CE.

1 11. The method of claim 1, wherein said first  
2 acknowledgment message is a tone sequence that is  
3 generated by a tone generator in said CE and decoded by a  
4 tone decoder in said UE.

1 12. The method of claim 1, wherein said first  
2 acknowledgment message is either a control message  
3 transmitted in a control channel of a first superframe  
4 transmitted from said CE to said UE or said first  
5 superframe itself.

1 13. The method of claim 1, wherein data that is received  
2 from said user workstation in said UE after transmission  
3 of said inverting request message, is stored in a FIFO  
4 buffer until said first acknowledgment message is  
5 received by said UE.

1 14. The method of claim 13, wherein transmission in  
2 reverse mode from said UE is authorized in response to  
3 said FIFO buffer being full prior to receipt of said  
4 first acknowledgment message by said UE.

15. A system for dynamically inverting an Asymmetric Digital Subscriber Line (ADSL) system comprising a central exchange equipment (CE) connected to a service provider network and a user equipment (UE) connected to a user workstation, wherein said CE and said UE are interconnected by a PSTN link, said CE including an input line for transmitting high-speed data from said service provider network to said user workstation and an output line for receiving medium-speed data from said user workstation and further comprising CE coding/decoding means for coding said high-speed data and decoding said medium-speed data, said UE including an input line for transmitting medium-speed data from said user workstation to said service provider network and an output line for receiving high-speed data from said service provider network and also including UE coding/decoding means for coding said medium-speed data and decoding said high-speed data, said system comprising:

means for transmitting an inverting request message from said UE to said CE;

means responsive to said inverting request message, for activating said CE coding/decoding means that codes medium-speed data on said CE input line and decodes high-speed data on said CE output line;

means for transmitting a first acknowledgment message from said CE to said UE informing said UE that transmission in reverse mode is authorized; and

29 means responsive to said first acknowledgment  
30 message, for activating said UE coding/decoding means.

1 16. The system of claim 15, further comprising means for  
2 transmitting a second acknowledgment message from said UE  
3 to said CE informing said CE that switching into reverse  
4 mode is completed.

1 17. The system of claim 16, wherein said second  
2 acknowledgment message is a tone sequence that is  
3 generated by a tone generator in said UE and decoded by a  
4 tone decoder in said CE.

1 18. The system of claim 16, wherein said second  
2 acknowledgment message is either a control message  
3 transmitted in a high-speed control channel from said UE  
4 to said CE or said superframe itself.

1 19. The system of claim 16, wherein data that is  
2 received by said CE from said service provider network  
3 after transmission of said first acknowledgment message  
4 from said CE to said UE, are stored in a FIFO buffer  
5 until said second acknowledgment message is received by  
6 said CE.

1 20. The system of claim 19, wherein transmission in  
2 reverse mode from said CE is authorized in response to  
3 said FIFO being full prior to said second acknowledgment  
4 message being received by said CE.

1 21. The system of claim 15, further comprising:

2 a tone generator for generating said inverting  
3 request message as a tone sequence; and

4 a tone decoder for decoding said inverting request  
5 message.

1 22. The system of claim 15, wherein said inverting  
2 request message is a control message transmitted in a  
3 control channel multiplexed with data in a data  
4 superframe transmitted from said UE to said CE.

1 23. The system of claim 15, further comprising:

2 a tone generator for generating said first  
3 acknowledgment message as a tone sequence; and

4 a tone decoder for decoding said first  
5 acknowledgment message.

1       24. The system of claim 15, wherein said first  
2       acknowledgment message is either a control message  
3       transmitted in a control channel of a first superframe  
  
4       transmitted from said CE to said UE or said first  
5       superframe itself.

1       25. The system of claim 15, further comprising a FIFO  
2       buffer for storing data that is received from said user  
3       workstation after transmission of said inverting request  
4       message until said first acknowledgment message is  
5       received by said UE.